

**EPA/ESD/R04-91/501
1991**

**EPA Superfund
Explanation of Significant Differences:**

**SANGAMO WESTON, INC./TWELVE-MILE CREEK/LAKE
HARTWELL PCB CONTAMINATION
EPA ID: SCD003354412
OU 01
PICKENS, SC
09/10/1991**

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION IV
SUPERFUND PROGRAM EXPLANATION OF SIGNIFICANT DIFFERENCES

SANGAMO WESTON/TWELVE-MILE CREEK/LAKE HARTWELL
PCB CONTAMINATION SITE
OPERABLE UNIT ONE
PICKENS, PICKENS COUNTY, SOUTH CAROLINA

Introduction

The purpose of this Explanation of Significant Differences (ESD) is to provide factual information to the public regarding a change in remedial activities for the Sangamo Weston/Twelve-Mile Creek/Lake Hartwell PCB Contamination Site, Operable Unit #1, in Pickens County, South Carolina (Site). In addition, this ESD explains the process that the Environmental Protection Agency (EPA) will follow to provide for a remedy which is protective of human health and the environment with respect to inorganic contamination (metals) at the Site. This ESD modifies the existing Record of Decision (ROD) by identifying metals in the soils and in the groundwater that have been found in amounts that may exceed acceptable health based levels. The ESD also modifies the ROD by adding clean up criteria for metals contamination in the groundwater and provides for additional testing and data gathering for metals at the Site. After this data is gathered, EPA will make a future determination regarding the necessity of remediating the metals contamination through an additional ESD or a ROD amendment. This ESD also clarifies the PCBs excavation standard selected in the ROD for two areas of the Site, and explains a response made by EPA to a comment received during a public meeting held to discuss the ROD.

This Explanation of Significant Differences (ESD) is issued as an EPA public participation responsibility pursuant to Section 117(c) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended by Superfund Amendments and Reauthorization Act (SARA), and Section 300.435(c)(2)(i) of the National Contingency Plan (NCP) 40 C.F.R. Part 300.

The administrative record file for the Site contains the information upon which this ESD was based, and includes the ROD for Operable Unit #1. This ESD will become part of the administrative record which is located at the following locations:

Pickens County Library, Pickens S.C.
Village Library, Pickens S.C.
Hart County Library, Hartwell Ga.
R. M. Cooper Library at Clemson University

Background

The remedy for the Sangamo/Weston/Twelve Mile Creek/Lake Hartwell site is presently divided into two Operable Units. Operable Unit #1 (OU-1) will address that portion of the site consisting of the seven parcels of property where PCBs, VOCs and metals were released into the soils and groundwater (the Sangamo/Weston plant property, the Nix, Welborn, Dodgen's, Breazeale, Trotter and Cross Roads properties). All seven of the properties are located in Pickens County, South Carolina. This ESD modifies only the ROD for OU-1. Throughout this ESD the term Site (upper case) is used to mean the seven properties described above. These locations are identified on the map included as Attachment A.

The remedial action for polychlorinated biphenyls (PCBs) and volatile organic compounds (VOCs) contamination at the Site is detailed by EPA in the ROD signed on December 19, 1990. In summary, the remedy selected in the ROD consists of groundwater remediation for PCBs and VOCs using pump and treat technology at the Dodgens, Breazeale, Cross Roads, and Plant properties; and the excavation of PCB and VOC contaminated soils at the Plant property and the six satellite properties. The excavated soils will be treated at the Plant property utilizing thermal separation technology.

Site History

Sangamo Weston Inc., owned and operated a capacitor manufacturing facility at the Plant property. The Pickens facility began operation in 1955 and continued operating until May 1987, when Sangamo Weston sold the operation and leased the buildings and a portion of the property to another manufacturer. On December 31, 1989, Sangamo Weston merged with Schlumberger Industries, Inc., (SII). SII is the present owner of the plant property portion of the Site. Between approximately 1955 and 1977 the facility manufactured capacitors which used a dielectric fluid that contained PCBs. During the manufacturing process, capacitors were inspected and tested, and those that failed to meet quality control criteria were discarded along with other wastes from the plants operation. Some of these wastes were disposed of on the Site.

Description of the Remedy

The ROD specifies that soils contaminated with PCBs and VOCs will be excavated and treated through Thermal Separation. This treatment technology consists of a low

temperature thermal heating unit which vaporizes PCBs and VOCs from the soil and recondenses them into a concentrated form so that they may be properly disposed of at an appropriate facility.

PCB and VOC contaminated soils will be excavated from the Site until acceptable health based levels specified in the ROD are reached. All excavated PCB contaminated soil material will be transported to the Plant property and will be treated by the Thermal Separation unit to residual PCB levels of 2 parts per million (ppm) or less. The treated soil will then be disposed of on the plant property. Because Thermal Separation is considered an innovative technology, treatability studies will be performed to determine if the technology will achieve the clean-up level of 2 ppm. If the treatability studies show that Thermal Separation is ineffective for all or a portion of the contaminated soils, EPA may, if necessary, formally amend the ROD to choose a new technology for remediation of the contaminated soils.

The remedy selected in the ROD for groundwater contaminated with PCBs and VOCs is to pump contaminated water and treat it using air stripping and/or carbon adsorption technology. Groundwater will be pumped until clean-up levels specified in the ROD are met or until such time as EPA determines that such clean-up levels are impracticable to achieve and that contingency measures should be implemented. Pumped groundwater will be treated to meet all Applicable or Relevant and Appropriate Requirements (ARARS), such as Clean Water Act NPDES effluent limitations, before being discharged to nearby existing water bodies such as creeks, and tributaries.

Description of Significant Differences

After the ROD was signed EPA determined that the ROD did not address several metals which had been listed as Constituents of Concern in Table 6-1 of the Appendix to the ROD. Upon further review of the sampling data gathered during the initial phases of the Remedial Investigation, EPA has determined that metals contamination at the Site may have been dismissed prematurely during the Remedial Investigation Feasibility Studies (RI/FS) process.

EPA has two concerns: 1) whether metals concentrations in the groundwater at the Site exceed maximum contaminant levels (MCLs) established by EPA for groundwater; and 2) whether the concentrations of certain metals in soils and waste at the Site might exceed acceptable health and risk based levels deemed to be protective of human health and the environment.

A) Groundwater

Limited groundwater sampling and analysis from the initial phases of the Remedial Investigation identifies metals in excess of MCLs in the groundwater at five of the satellite properties and at the Plant property. This sampling data is attached as Appendix B.

The metals listed on the chart below have been found in groundwater at areas of the Site in levels exceeding MCLs. Through this ESD, EPA is modifying the ROD to add the MCLs for the listed metals as clean-up criteria at the Site.

EPA has also determined that further groundwater sampling at all areas of the Site is necessary (including the possible installation of additional monitoring wells) to delineate the nature and extent of the metals contamination and to determine if there is a demonstrated plume of metal contamination requiring remediation.

At the properties where pump and treat remedial technology is presently called for in the ROD, groundwater will be pumped until MCLs for the listed metals, as well as the PCB and VOC levels specified in the ROD, are reached. Utilizing the additional sampling data called for in this ESD, EPA will make a future determination as to what addition remedial technology, if any, will be necessary to treat pumped groundwater containing metals. EPA will also determine if groundwater at any additional properties (Nix, Welborn and Trotter) needs to be remediated for metals. EPA will incorporate these determinations into the ROD through an additional ESD or a ROD amendment after a public comment period. The clean-up criteria listed below shall also be incorporated into such additional ESD or ROD amendment. The following chart lists the metals of concern and the appropriate MCL clean-up levels for each metal.

<u>METALS</u>	<u>MCL CLEAN UP CRITERIA</u>
Arsenic	0.050 ppm
Beryllium	0.001 ppm
Cadmium	0.005 ppm
Chromium	0.100 ppm
Lead	0.015 ppm(1)
Thallium	0.001 ppm

B) Soils

Based on the limited sampling and analysis data presently available regarding metals in the soils at the Site, EPA has determined that metals found in the soils may exceed acceptable health based risk levels. Utilizing existing data, EPA has identified metals in the soils which may require additional remediation, but needs additional information on specific conditions at the Site to calculate acceptable metal concentration levels. Therefore, EPA has determined that additional soil sampling activities for metals will be conducted at the Site. These data gathering activities will enable EPA to develop acceptable levels for metals in the surface and subsurface soils and will allow EPA to determine the geographic extent of the metals soil contamination at the Site. Following review of the new data, EPA will make a determination of what additional soil clean-up criteria and additional remedial technology, if any, will be needed to remediate the metal contaminated soil. EPA will incorporate any new soil clean-up criteria and remedial technology into the ROD through an additional ESD or ROD amendment after a public comment period.

EPA will calculate the acceptable subsurface soil concentration criteria utilizing test procedures to establish soil partition coefficients which will establish the mobility of the metals in the soils and subsequently, through modeling, establish a concentration that is protective of groundwater. Acceptable surface soils concentration criteria will be developed based on direct exposure routes.(2)

The following chart lists the metals which may exceed acceptable health based levels at the Site.

INORGANIC METALS CONTAMINANT

Arsenic (3)
Chromium (4)
Lead (5)
Thallium (6)
Beryllium (7)
Cadmium (8)

PCB Excavation Levels For The Nix and Welborn Properties

This ESD also clarifies the excavation clean-up criteria for PCB contaminated soils at the Nix and Welborn properties. The ROD presently calls for the excavation of all contaminated soils at the Nix and Welborn properties having greater than 1 ppm of PCBs. However, the 1 ppm level called for in the ROD is based on the concern that at the ravines located on the two properties, erosion factors are too severe to assure that a 2 foot backfill of clean soil would remain in place.

Where EPA determines that erosion is not a concern on the two properties, PCB contaminated soils will be excavated to the levels specified in the ROD for the four possible future residential properties (Trotter, Dodgens, Breazeale, and Cross Roads), i.e. requiring excavation to 10 ppm PCBs with a backfill cover of 2 feet of clean soil. The final EPA determination regarding erosion and/or backfilling at the two properties will be made during the Remedial Design phase.

Clarification of Prior EPA Response to Public Comments

Upon review of the Responsiveness Summary, (ROD Appendix C), EPA identified a response to a question received during a public meeting that may have been unclear. The original comment and response as stated on pages 15 and 16 of the Responsiveness Summary is as follows:

An attendee commented that ground-water contamination has existed for ten years and that hazardous waste continues to leach into the ground water. The attendee asked whether it was possible for EPA to conduct a short-term removal action at the site, such as excavating the soil which is leaching into the ground water.

EPA RESPONSE: Removals are performed where imminent and substantial endangerment is posed by a hazardous waste site. In this case, no imminent threat exists because no one is drinking the groundwater; no one is exposed at this point. The leaching, to a great extent, has already taken place and is slow. Part of the remedy is to excavate and treat the soil. Excavating and stockpiling it prior to completion and approval of a treatment design, however, could create a problem elsewhere.

By this response, EPA did not intend to suggest that an imminent and substantial endangerment to public health and the environment does not exist at the Site. The intent of EPA and the responder was to say that an immediate threat to public health necessitating use of EPA's removal authority has not been demonstrated by conditions at the Site.

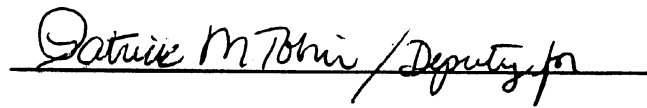
Support Agency Comments

South Carolina's Department of Health and Environmental Control has reviewed this ESD and concurs with its contents.

Statutory Determinations

The modifications made to the ROD by this ESD are designed to assure that the remedy at the Site will be protective of human health and the environment, and will comply with Federal and State requirements that are applicable or relevant and appropriate.

After the additional data called for in this ESD has been gathered and evaluated, EPA will use an additional ESD or a ROD amendment to modify the ROD to incorporate any additional necessary clean-up criteria for metals and to choose necessary additional remedial technologies for metals. Any additional ESD or ROD amendment will include a public comment period.



Greer C. Tidwell
Regional Administrator

SEP 10 1991

Date

FOOTNOTES

(1) In reviewing the initial data for lead contamination, EPA used the old MCL of 0.050 ppm. However, EPA Headquarters Superfund Program had set a Superfund Program Action level for lead clean-up at the lower level of .015 ppm. The rationale for this health based clean-up level is explained in memorandum to EPA Region IV, dated June 21, 1990 and attached as Appendix C).

(2) Surface soils were sampled for metals at the Welborn property. The Welborn sampling was limited to lead, barium and zinc. The soils data available for the remaining properties are for the waste areas and subsurface soils. Based on this information and data regarding metals found at elevated levels in the groundwater, EPA has determined that the listed metals may be present at levels of concern in surface soils. The surface soil clean-up criteria will be calculated based on direct contact exposure routes. Subsurface soil cleanup concentrations will be calculated to protect groundwater. Should the cleanup criteria for subsurface soils be lower than those calculated for surface soils the lower criteria shall be the clean-up goal for all soils.

(3) Based on averaged background levels for the surrounding area.

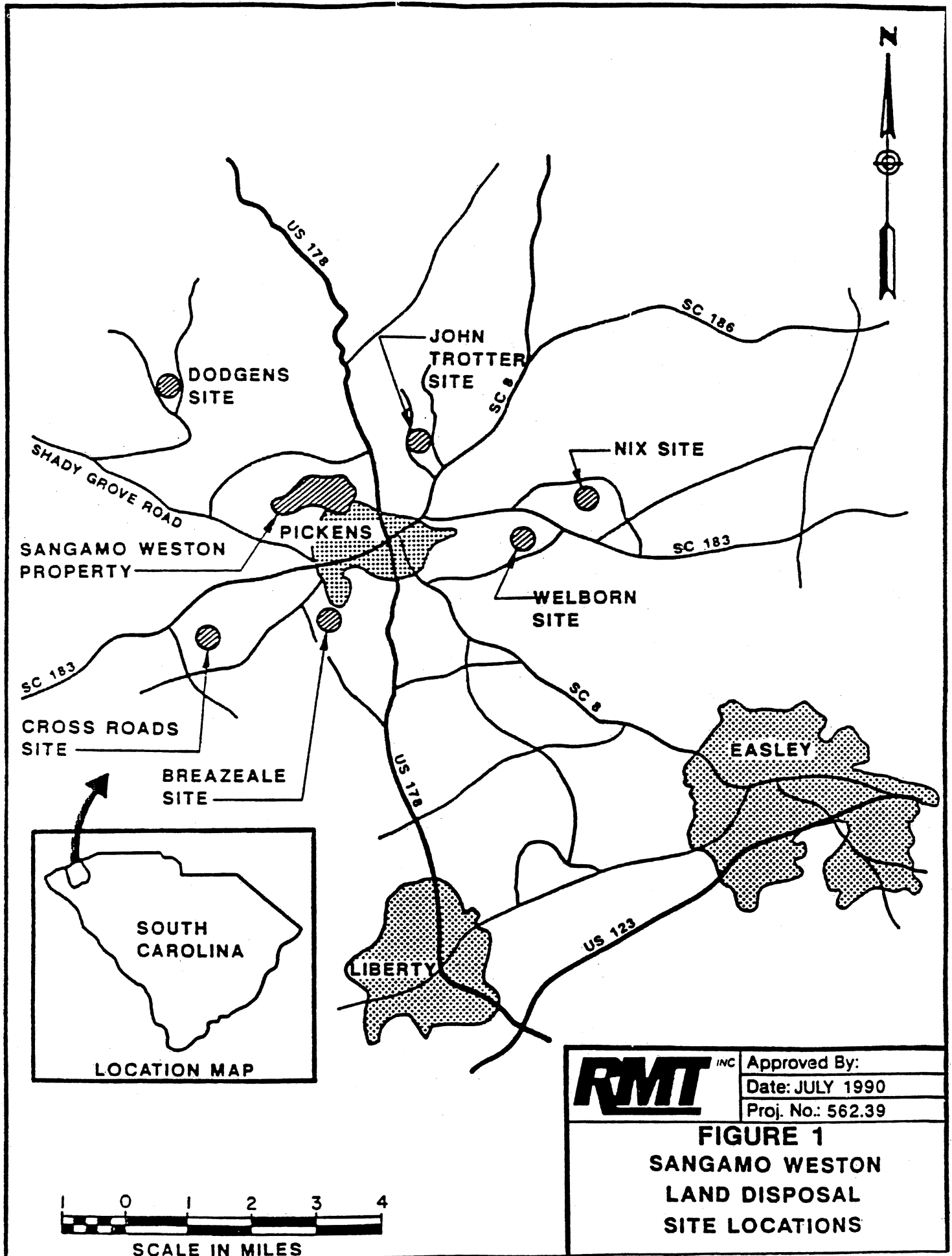
(4) Assumes <10% hexavalent chromium present. Further sampling will be done to confirm this assumption. If EPA can not confirm the percentage of hexavalent chromium at the Site it will determine the acceptable risk levels based on the worst case scenario of the presence of 100% hexavalent chromium. 100% Hexavalent Chromium at the Site would lower the clean-up level.

(5) Consistent with SUPERFUND Policy pursuant to OSWER Directive 9355.4-02.

(6) Thallium was detected in groundwater at levels exceeding MCLs. It was not detected in unacceptable levels in the existing soil samples. However, because thallium was detected in the groundwater it is listed herein. The surface soil remediation goal for thallium will be based on the chemical-specific noncarcinogenic reference dose for the oral exposure route. The subsurface remediation goal will be set at the level that is protective of groundwater.

(7) Beryllium was detected in several waste and subsurface soils exceeding the acceptable risk levels for direct contact through surface soils. The remediation surface soil goal will be based on oral and inhalation carcinogenic slope factors. The subsurface soil remediation goal will be set at the level that is protective of the groundwater.

(8) Cadmium was detected in groundwater at levels exceeding MCLs. It was not detected in unacceptable levels in existing soil samples. However, because cadmium was detected in the groundwater it is listed herein. The surface soil remediation goal for Cadmium will be based on the chemical-specific noncarcinogenic reference dose for the oral exposure route. The subsurface soil remediation goal will be set to the level that is protective of the groundwater.



ATTACHMENT B

<u>METAL</u>	<u>MCL</u>	<u>SAMPLE #</u>	<u>CONCENTRATION</u>
Arsenic	.050 PPM	JTMW-3	.213 PPM
Beryllium	.001 PPM	JTMW-3	.007 PPM
Cadmium	.005 PPM	CRMW-3	.011 PPM
Chromium	.100 PPM	JTMW-3	.190 PPM
Thallium	.001 PPM	SWMW-4	.016 PPM
Lead	.015 PPM	WBMW-3	.054 PPM
		JTMW-3	.093 PPM
		CRMW-3	.055 PPM
		DGMW-3	.038 PPM
		NXMW-3	.020 PPM
		SWMW-6	.063 PPM

ATTACHMENT C



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

MEMORANDUM

JUN 21 1990

SUBJECT: Cleanup Level for Lead in Ground Water

FROM: Henry L. Longest, Director
Office of Emergency and Remedial Response

Bruce M. Diamond, Director
Office of Waste Programs Enforcement

TO: Patrick M. Tobin, Director
Waste Management Division, Region IV

PURPOSE

This memorandum addresses the issue of a protective cleanup level for lead in ground water usable for drinking water, which is a major concern for several Superfund sites in Region IV.

OBJECTIVE

The objective of this memorandum is to recommend a final cleanup level for lead in ground water usable for drinking water which will meet the CERCLA requirement that all Superfund remedies be protective of human health and the environment.

BACKGROUND

The current Maximum Contaminant Level (MCL) for lead is 50 ppb and was promulgated in 1975 as an interim national primary drinking water regulation (NPDWR) under the Safe Drinking Water Act (SDWA). On November 13, 1985, the Agency began the process of revising this standard by proposing a Maximum Contaminant Level Goal (MCLG) as required by the SDWA (50 FR 46936).

On August 18, 1988 EPA proposed an MCLG for lead at zero and an MCL of 5 ppb (53 FR 31516). Also, since the primary cause of lead-contaminated drinking water is corrosion of lead-bearing pipes in public water supply (PWS) distribution systems and/or household plumbing, the proposed rule would direct PWSs to meet treatment technique requirements and to deliver public education to reduce and minimize exposures to lead in drinking water.

These requirements would be triggered when an action level is exceeded at consumers' taps throughout the water distribution system. The Agency proposed an action level of 10 ppb, on average, to trigger corrosion control and public education. Another lead action level of 20 ppb, measured at the 95 percentile of samples, was proposed as a trigger for public education.

The Agency is considering promulgation of treatment technique requirements which may include additional source water treatment, lead service connection replacement, and public education if lead concentrations at the tap exceed an action level. Any such technological treatment targets will provide substantial health protection. A final rule is being worked on, and is scheduled for promulgation in December 1990.

DISCUSSION

No cancer potency factor or reference dose has been promulgated for lead; therefore, an assessment of protective levels of lead in ground water that may be used for drinking water purposes will be based on current data. The Agency has identified 10 micrograms per deciliter (ug/dl) as a blood lead level of concern in young children. Blood lead levels above 10 ug/dl are associated with increased risks of potentially adverse effects on neurological development and diverse physiological functions.

Attached is available data that support the recommended final cleanup level for lead in drinking water at Superfund sites. This information includes the June 15, 1990, EPA draft final report entitled, "Contributions To a Risk Assessment For Lead in Drinking Water" and the June 1986, EPA draft final report entitled, "Air Quality Criteria for Lead" (Volume III of IV, p. 11-129). Based on these data, lead levels in drinking water of 15 ppb and lower should correlate to blood lead levels below the concern level of 10 ug/dl. The Agency estimates that steady exposure to a water lead concentration of 15 ppb would contribute, at most, 2-3 ug/dl to a child's blood lead. Sources of lead other than drinking water (e.g. food, air, soil, dusts) typically contribute approximately 4-5 ug/dl to children's blood lead. Accounting for the variability inherent in childhood behavior, nutrition, and physiology, it is estimated that total lead exposure, given 15 ppb in drinking water, would result in blood lead levels below 10 ug/dl in

roughly 99 percent of young children who are not exposed to excessive lead paint hazards or heavily contaminated soils. Therefore, a 15 ppb cleanup level would provide substantial health protection for the majority of young children. Most of the remaining lead problem will continue to be contaminated soils and old lead-painted housing.

In an April 10, 1989, Federal Register notice (54 FR 14316), EPA announced the availability of a guidance document and testing protocol entitled, "Lead in School's Drinking Water," to assist schools in determining the source and degree of lead contamination in school drinking water supplies and how to remedy such contamination. That document, which is also attached, recommends that schools take remedial steps whenever the lead level at any drinking water outlet exceeds 20 ppb.

RECOMMENDATION

Based on a review of these and other studies, it is recommended that a final cleanup level of 15 ppb for lead in ground water usable for drinking water is protective. If water used for drinking purposes subsequent to achieving the cleanup goal in the aquifer may need further treatment to account for lead contributions related to the distribution of water through pipes, the responsibility for this additional treatment or the replacement of lead-bearing water pipes lies with the persons who are using or distributing the water. A concentration of lead of 15 ppb in drinking water should generally correlate with a blood lead level below the concern level of 10 ug/dl. In some situations, lower cleanup levels may be appropriate based on site-specific factors, such as multiple pathways of exposure caused by lead from the site.

If the remedial action will include treatment and supplying water directly to the public for drinking water consumption, compliance with a 15 ppb action level should be met at 90 percent of the taps to ensure that the remedy is protective. When the lead NPDWR is promulgated, applicable or relevant and appropriate requirements of that rule should be met.

FUTURE GUIDANCE

After promulgation of the lead NPDWR, guidance will be issued discussing those provisions of the rule that may be applicable or relevant and appropriate for Superfund actions.

For further information, please contact Tish Zimmerman at FTS 382-2461 or Neilima Senjalia at FTS 475-7027.